Class 12 Chemistry Sample Question Paper 2026–27

Time Allowed : 3 Hours Maximum Marks : 70

General Instructions

1. This question paper contains 33 questions divided into five sections.
2. All questions are compulsory.
3. Section A contains 16 multiple-choice questions of 1 mark each.
4. Section B contains 5 questions of 2 marks each.
5. Section C contains 7 questions of 3 marks each.
6. Section D contains 2 case-based questions of 4 marks each.
7. Section E contains 3 long-answer questions of 5 marks each.
8. Internal choices are provided in some questions.
9. Use of a calculator is not permitted.
10. Use appropriate units wherever necessary. Assume suitable conditions wherever required.

Section A – Multiple Choice Questions

Questions 1–16 carry 1 mark each. (16 × 1 = 16)

Choose the correct option.

Q1. Which of the following concentration terms is independent of temperature?

(a) Molarity (b) Molality (c) Normality (d) Volume percentage

Q2. The value of van't Hoff factor for KCl in an ideal dilute aqueous solution is:

(a) 1 (b) 2 (c) 3 (d) 0.5

Q3. The SI unit of conductivity is:

(a) S m^{-1} (b) S m^2 mol^{-1} (c) Ω m (d) S mol^{-1}

Q4. The standard electrode potential of the standard hydrogen electrode is:

(a) 1.00 V (b) 0.00 V (c) –1.00 V (d) 0.76 V

Q5. For a first-order reaction, the unit of rate constant is:

(a) mol L^{-1} s^{-1} (b) L mol^{-1} s^{-1} (c) s^{-1} (d) mol^2 L^{-2} s^{-1}

Q6. Which of the following is a transition element?

(a) Na (b) Ca (c) Fe (d) Al

Q7. The oxidation state of chromium in $K_2Cr_2O_7$ is:

(a) +2 (b) +3 (c) +6 (d) +7

Q8. Which of the following is a strong field ligand?

(a) Cl^- (b) F^- (c) H_2O (d) CN^-

Q9. The coordination number of cobalt in $[Co(NH_3)_6]Cl_3$ is:

(a) 3 (b) 4 (c) 6 (d) 9

Q10. Which reagent is commonly used for the conversion of alcohols into alkyl chlorides?

(a) NaOH (b) $SOCl_2$ (c) H_2SO_4 (d) $KMnO_4$

Q11. Which of the following undergoes SN1 reaction most readily?

(a) CH_3Cl (b) CH_3CH_2Cl (c) $(CH_3)_3CCl$ (d) $CH_3CH_2CH_2Cl$

Q12. Phenol is more acidic than ethanol because:

(a) Phenol has a higher molecular mass. (b) Phenoxide ion is stabilised by resonance.

(c) Ethanol is aromatic. (d) Phenol is insoluble in water.

Q13. Which of the following gives a positive Tollens' test?

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(a) Propanone (b) Ethanal (c) Benzophenone (d) Acetophenone

Q14. Which of the following is the most basic in aqueous solution?

(a) Aniline (b) Ammonia (c) Methylamine (d) Diphenylamine

Q15. Which of the following is a reducing sugar?

(a) Sucrose (b) Glucose (c) Both sucrose and glucose (d) Neither sucrose nor glucose

Q16. Which vitamin is responsible for blood clotting?

(a) Vitamin A (b) Vitamin B_{12} (c) Vitamin C (d) Vitamin K

Section B – Very Short Answer Questions

Questions 17–21 carry 2 marks each. (5 × 2 = 10)

Q17. Define the following terms:

(a) Mole fraction (b) Molality

Q18. Calculate the EMF of a galvanic cell having the following standard electrode potentials:

Ecathode∘=+0.80 VE^\circ_{\text{cathode}}=+0.80\,V

Eanode∘=−0.44 VE^\circ_{\text{anode}}=-0.44\,V

Q19. What is the difference between order and molecularity of a reaction? Write any two points.

Q20. Why do transition elements show variable oxidation states? Give one example.

Q21. Write the IUPAC names of the following coordination compounds:

(a) $[Co(NH_3)_6]Cl_3$

(b) $K_4[Fe(CN)_6]$

Section C – Short Answer Questions

Questions 22–28 carry 3 marks each. (7 × 3 = 21)

Q22. A solution is prepared by dissolving 5.85 g of NaCl in 500 g of water. Calculate the molality of the solution.

(Given: Molar mass of NaCl = 58.5 g mol^{-1})

Q23. Explain Kohlrausch's law of independent migration of ions. Write one application of this law.

Q24. For a first-order reaction, derive the expression for its half-life period. How does half-life depend on the initial concentration?

Q25. Explain the following properties of transition elements:

(a) Variable oxidation states (b) Formation of coloured ions

(c) Catalytic properties

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Q26. Explain the following:

(a) Why are haloarenes less reactive towards nucleophilic substitution reactions than haloalkanes?

(b) Why is chlorobenzene resistant to hydrolysis under ordinary conditions?

(c) Write the equation for the nitration of chlorobenzene.

Q27. How will you distinguish between aldehydes and ketones using chemical tests? Explain with suitable chemical equations.

Q28. Answer the following questions:

(a) Why is aniline less basic than methylamine?

(b) What is diazotisation?

(c) Write the chemical equation for the reaction of aniline with nitrous acid at 273–278 K.

Section D – Case-Based Questions

Questions 29–30 carry 4 marks each. (2 × 4 = 8)

Q29. Electrochemical Cells

An electrochemical cell converts chemical energy into electrical energy through a spontaneous redox reaction. A Daniell cell consists of a zinc electrode dipped in zinc sulphate solution and a copper electrode dipped in copper sulphate solution. The two solutions are connected through a salt bridge.

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Answer the following questions:

(a) Which electrode acts as the anode? (1)

(b) Write the oxidation reaction occurring at the anode. (1)

(c) What is the function of the salt bridge? (1)

(d) In which direction do electrons flow through the external circuit? (1)

Q30. Biomolecules

Carbohydrates are essential biomolecules that serve as a major source of energy. They are classified into monosaccharides, oligosaccharides and polysaccharides. Glucose and fructose are examples of monosaccharides, while sucrose is a disaccharide.

Answer the following questions:

(a) What are monosaccharides? (1)

(b) Name the two monosaccharide units present in sucrose. (1)

(c) Why is sucrose called a non-reducing sugar? (1)

(d) Name the polysaccharide that acts as the storage carbohydrate in plants. (1)

Section E – Long Answer Questions

Questions 31–33 carry 5 marks each. (3 × 5 = 15)

Q31. (a) State Raoult's law for a solution containing volatile components. (2)

(b) Differentiate between ideal and non-ideal solutions. (2)

(c) What is an azeotrope? (1)

OR

(a) Define osmotic pressure. (1)

(b) Explain how osmotic pressure is used to determine the molar mass of a solute. (2)

(c) Calculate the osmotic pressure of a solution containing 2 g of a substance dissolved in 500 mL of solution at 300 K. The molar mass of the substance is 60 g mol^{-1}.

Given: R=0.0821 L atm mol−1K−1R = 0.0821\ L\,atm\,mol^{-1}K^{-1}. (2)

Q32. (a) Explain the mechanism of nucleophilic addition reactions in aldehydes and ketones. (2)

(b) Write chemical equations for the following reactions: (3)

(i) Aldol condensation of ethanal.

(ii) Cannizzaro reaction of formaldehyde.

(iii) Oxidation of ethanal to ethanoic acid.

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OR

(a) How are carboxylic acids prepared from primary alcohols? (1)

(b) Explain the Hell-Volhard-Zelinsky reaction with a chemical equation. (2)

(c) Why are carboxylic acids more acidic than phenols? (2)

Q33. (a) Explain Werner's theory of coordination compounds. (2)

(b) Write the IUPAC name of $[Cr(NH_3)_4Cl_2]Cl$. (1)

(c) Explain geometrical isomerism in coordination compounds with a suitable example. (2)

OR

(a) What is crystal field splitting? (2)

(b) Differentiate between strong field and weak field ligands. (1)

(c) Explain why $[Ni(CN)_4]^{2-}$ is diamagnetic. (2)